

## RTV11

### Description

RTV11, RTV21 and RTV41 silicone rubber compounds are general purpose two-part silicone elastomers. They are supplied ready-to-use with a base compound and DBT (dibutyl tin dilaurate) as the standard curing agent. DBT is suitable for most applications, however other catalysts are available to facilitate deep section cure, faster cure and automated mixing.

These silicone rubber compounds are similar in physical properties except for viscosity and color:

Grade	Color	Typical Viscosity
RTV11	white	11,000 cps
RTV21	pink	26,000 cps
RTV41	white	39,000 cps

### Key Features and Benefits

- Work time and cure rates can be varied
- Room temperature cure
- Composition free of solvents and solvent odor
- FDA compliance - RTV11 and RTV41 silicone rubber compounds can be used in food contact applications other than contact with acidic foods where FDA regulations apply.
- Excellent adhesion capabilities with primer
- Excellent release properties
- Retention of elastomeric properties at temperatures from -54°C (-65°F) up to 204°C (400°F) continuously, and up to 260°C (500°F) for short periods of time.

**Typical Physical Properties****UNCURED PROPERTIES OF RTV BASE COMPOUNDS**

	<b>RTV11</b>	<b>RTV21</b>	<b>RTV41</b>
Color	White	Pink	White
Consistency	Easily Pourable	Pourable	Pourable
Viscosity, cps	11,000	26,000	39,000
Specific Gravity	1.19	1.32	1.31

**UNCURED PROPERTIES OF RTV BASE COMPOUNDS WITH 0.5% DBT CURING AGENT ADDED**

	<b>RTV11</b>	<b>RTV21</b>	<b>RTV41</b>
Work Time @ 25°C (77°F), hrs	1.5	1	1
Cure Time @ 25°C (77°F), hrs	24	24	24

**CURED PROPERTIES**

**(0.5 wt. % DBT Curing Agent added, cured 7 days @ 25°C (77°F) and 50% R.H.)**

	RTV11	RTV21	RTV41
<b>Mechanical</b>			
Hardness, Shore A Durometer	41	45	47
Tensile Strength, kg/cm <sup>2</sup> (psi)	36 (510)	22 (310)	36 (520)
Elongation, %	190	210	190
Tear Strength, kg/cm (lb/in)	3.5 (20)	7.1 (40)	5.2 (29)
Shrinkage, %	0.6	0.6	0.6
<b>Electrical</b>			
Dielectric Strength, kv/mm (v/mil) (1.9 mm thick)	20.3 (515)	16.5 (420)	20.3 (520)
Dielectric Constant @ 1000 Hz	3.3	3.8	3.7
Dissipation Factor @ 1000 Hz	0.006	0.02	0.007
Volume Resistivity, ohm-cm	1.1 x 10 <sup>15</sup>	2.6 x 10 <sup>14</sup>	1.6 x 10 <sup>14</sup>
<b>Thermal</b>			
Useful Temperature Range, °C (°F)	-54 to 204 (-65 to 400)	-54 to 204 (-65 to 400)	-54 to 204 (-65 to 400)
Thermal Conductivity (W/mK)	0.29	0.31	0.31
Coefficient of Expansion, cm/cm, °C (in/in, °F)	25 x 10 <sup>-5</sup> (14 x 10 <sup>-5</sup> )	20 x 10 <sup>-5</sup> (11 x 10 <sup>-5</sup> )	20 x 10 <sup>-5</sup> (11 x 10 <sup>-5</sup> )
Specific Heat, cal/gm, °C (BTU/lb, °F)	0.35 (0.35)	0.35 (0.35)	0.35 (0.35)

## Potential Applications

Typical applications include, but are not limited to:

- Potting and encapsulating electrical coils and connectors
- Making cast-in-place gaskets and molds
- Release applications such as providing a surface on metals and fabrics from which paint and adhesives can be easily stripped

## Processing Recommendations

### Mixing

Select a mixing container 4 to 5 times larger than the volume of RTV silicone rubber compound to be used. Weigh out the RTV silicone rubber base compound and add the

appropriate amount of curing agent. 0.5% DBT by weight will provide a work time or pot life of about one hour and a cure time of 24 hours. 0.5% DBT is the most commonly used concentration of curing agent for RTV11, RTV21 and RTV41 silicone rubber compounds. The pot life may be lengthened by using less DBT (as little as 0.1%).

### MEASURING GUIDE FOR CURING AGENT ADDITION

RTV Weight	Dibutyl Tin Dilaurate Concentration	
	0.1%	0.5%
100 grams	5 drops	25 drops
454 grams (1 lb.)	23 drops	115 drops (2.27 grams)

With clean tools, thoroughly mix the RTV base compound and the curing agent, scraping the sides and bottom of the container carefully to produce a homogeneous mixture. When using power mixers, avoid excessive speeds which could entrap large amounts of air or cause overheating of the mixture, resulting in shorter pot life.

### Deaeration

Air entrapped during mixing should be removed to eliminate voids in the cured product. Expose the mixed material to a vacuum of about 25 mm (29 in.) of mercury. The material will expand, crest, and recede to about the original level as the bubbles break. Degassing is usually complete about two minutes after frothing ceases. When using the RTV silicone rubber compound for potting, a deaeration step may be necessary after pouring to avoid capturing air in complex assemblies.

### Curing

Using DBT curing agent at a level of 0.5%, these RTV silicone rubber compounds will cure in 24 hours at 25°C (77°F) and 50% relative humidity to form durable, resilient rubbers. Under these conditions a pot life of about one hour will typically be available for pouring and working with the catalyzed material. Pot life may be increased by refrigerating the mixed material at 0°C (32°F) after catalyzing.

A choice of curing agents is available for use with RTV11, RTV21 and RTV41 silicone rubber compounds.

<b>Curing Agent</b>	<b>Cure Speed</b>	<b>Curing Agent Concentration</b>	<b>Features</b>
DBT	moderate	0.1-0.5%	standard
STO	fast	0.1-0.5%	small volume applications
RTV9811	moderate	5-10%	good deep section cure suitable for automatic mixing
RTV9950	moderate	5-10%	suitable for automatic mixing
RTV9910	slow	10%	suitable for automatic mixing

### **Deep Section Cure**

If these RTV silicone rubber compounds are to be used in deep sections at temperatures over 150°C (302°F), the cured product should be properly conditioned prior to service. Following room temperature cure of 1-3 days, a typical program would be eight hours at 50°C intervals from 100°C (212°F) to the service temperature. Longer times at each temperature will be required for larger parts or very deep sections.

### **Bonding**

If adhesion is an important application requirement, RTV11, RTV21 and RTV41 silicone rubber compounds require a primer to bond to non-silicone surfaces. Thoroughly clean the substrate with a non-oily solvent such as naphtha or methyl ethyl ketone (MEK) and let dry. Then apply a uniform thin film of a suitable silicone primer such as SS4004. Allow the primer to air dry for one hour or more. Finally, apply freshly catalyzed RTV silicone rubber compound to the primed surface and cure as recommended.

### **Specifications**

#### **AGENCY STATUS**

RTV11 and RTV41 silicone rubber compounds may be used in food contact application other than acidic foods where FDA regulations apply.

### **General Considerations for Use**

While the typical operating temperature for silicone materials ranges from -45°C to 200°C, the long-term maintenance of its initial properties is dependent upon design related stress considerations, substrate materials, frequency of thermal cycles, and

other factors.

### **Patent Status**

Nothing contained herein shall be construed to imply the nonexistence of any relevant patents or to constitute the permission, inducement or recommendation to practice any invention covered by any patent, without authority from the owner of the patent.

### **Product Safety, Handling and Storage**

Customers should review the latest Safety Data Sheet (SDS) and label for product safety information, safe handling instructions, personal protective equipment if necessary, emergency service contact information, and any special storage conditions required for safety. Momentive Performance Materials (MPM) maintains an around-the-clock emergency service for its products. SDS are available at [www.momentive.com](http://www.momentive.com) or, upon request, from any MPM representative. For product storage and handling procedures to maintain the product quality within our stated specifications, please review Certificates of Analysis, which are available in the Order Center. Use of other materials in conjunction with MPM products (for example, primers) may require additional precautions. Please review and follow the safety information provided by the manufacturer of such other materials.

### **Limitations**

Customers must evaluate Momentive Performance Materials products and make their own determination as to fitness of use in their particular applications.

### **Contact Information**

For product prices, availability, or order placement, contact our customer service at [Momentive.com/CustomerService/](http://Momentive.com/CustomerService/)

For literature and technical assistance, visit our website at: [www.momentive.com](http://www.momentive.com)

**DISCLAIMER:**

**THE MATERIALS, PRODUCTS AND SERVICES OF MOMENTIVE PERFORMANCE MATERIALS INC. AND ITS SUBSIDIARIES AND AFFILIATES (COLLECTIVELY “SUPPLIER”), ARE SOLD SUBJECT TO SUPPLIER’S STANDARD CONDITIONS OF SALE, WHICH ARE INCLUDED IN THE APPLICABLE DISTRIBUTOR OR OTHER SALES AGREEMENT, PRINTED ON THE BACK OF ORDER ACKNOWLEDGMENTS AND INVOICES, AND AVAILABLE UPON REQUEST. ALTHOUGH ANY INFORMATION, RECOMMENDATIONS, OR ADVICE CONTAINED HEREIN IS GIVEN IN GOOD FAITH, SUPPLIER MAKES NO WARRANTY OR GUARANTEE, EXPRESS OR IMPLIED, (i) THAT THE RESULTS DESCRIBED HEREIN WILL BE OBTAINED UNDER END-USE CONDITIONS, OR (ii) AS TO THE EFFECTIVENESS OR SAFETY OF ANY DESIGN INCORPORATING ITS PRODUCTS, MATERIALS, SERVICES, RECOMMENDATIONS OR ADVICE. EXCEPT AS PROVIDED IN SUPPLIER’S STANDARD CONDITIONS OF SALE, SUPPLIER AND ITS REPRESENTATIVES SHALL IN NO EVENT BE RESPONSIBLE FOR ANY LOSS RESULTING FROM ANY USE OF ITS MATERIALS, PRODUCTS OR SERVICES DESCRIBED HEREIN.** Each user bears full responsibility for making its own determination as to the suitability of Supplier’s materials, services, recommendations, or advice for its own particular use. Each user must identify and perform all tests and analyses necessary to assure that its finished parts incorporating Supplier’s products, materials, or services will be safe and suitable for use under end-use conditions. Nothing in this or any other document, nor any oral recommendation or advice, shall be deemed to alter, vary, supersede, or waive any provision of Supplier’s standard Conditions of Sale or this Disclaimer, unless any such modification is specifically agreed to in a writing signed by Supplier. No statement contained herein concerning a possible or suggested use of any material, product, service or design is intended, or should be construed, to grant any license under any patent or other intellectual property right of Supplier covering such use or design, or as a recommendation for the use of such material, product, service or design in the infringement of any patent or other intellectual property right.

**Momentive and the Momentive logo are trademarks of Momentive Performance Materials Inc.**